CASE REPORT

Small bowel injury after suprapubic catheter insertion presenting 3 years after initial insertion

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SUMMARY

A 77-year-old woman was referred to urology with blockages of her suprapubic catheter (SPC). The catheter was replaced easily in the emergency department, however, no urine was draining, only a cloudy green fluid was visible. On cystoscopy bilious material was identified in the bladder. There was no catheter visible. There seemed to be a fistulous tract entering the bladder at the left dome. The urethra was dilated, a urethral catheter was placed and the SPC was removed. A CT demonstrated that the SPC tract transfixed a loop of pelvic small bowel and entered the bladder with no intraperitoneal contrast leak. The patient recovered well and did not require laparotomy. This case emphasises that bowel perforation, although rare, must be considered as a complication of SPC placement even years after initial insertion when catheter problems arise. Unusually, we learn that this complication may not present with abdominal pain or peritonism.

BACKGROUND

General practitioners and community nurses commonly manage suprapubic catheters (SPCs) in the community. Problems with blocked SPCs and/or difficulty with reinsertion are a common reason for referral to urology on-call services. Bowel injury is a recognised serious complication of SPC insertion, however, it is usually identified at the time of insertion or, in rare case reports, within months of insertion usually at the first catheter change. Previous lower abdominal surgery increases the risk of this complication therefore cystoscopic placement was undertaken in this case.

To the authors' knowledge this is the first case report of bowel perforation secondary to SPC insertion presenting 3 years after initial insertion and without abdominal signs or symptoms.

We learn from the case that bowel perforation can present at any time after initial SPC insertion (even years later) and that it may not present with abdominal pain.

Community healthcare professionals should have a low threshold for urology referral for recurrent SPC blockage and for urgent referral in cases of failed replacement or bilious drainage.

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CASE PRESENTATION

Presentation

In March 2013, a 77-year-old woman was referred to urology on-call with instant blockages of her SPC during attempted changes by community nursing staff. The catheter had been replaced three times but each time blocked within minutes of reinsertion after initially draining urine. In the acute receiving unit, SPC was reinserted by a urological registrar without difficulty and 10 mL injected to the balloon. A thick green fluid began draining into the catheter bag. On attempted saline flushing of SPC, the patient noted liquid draining per urethra. The patient had had a colostomy formed 9 years previously and this was functioning normally. There was no abdominal pain, tenderness or palpable masses. The patient felt well. The patient was without fever, her heart rate was 110 bpm. The patient was admitted for observations and investigations.

Medical history

The patient had a medical history of rectal adenocarcinoma and had undergone anterior resection in August 2004 (9 years previous to this presentation) with adjuvant radiotherapy. The resection involved removal of two-thirds of her vagina. In 2008 she had a pelvic MRI to investigate vaginal discharge that was normal. In 2010 6 years after her cancer treatment (3 years before this presentation) the patient presented with chronic urine retention. This was attributed to urethral and vaginal stenosis caused by her vaginal resection and identified on clinical examination and uroflowmetry by a consultant urologist. Urethral catheterisation was tried and failed. In agreement with the patient it was decided not to undertake urethral dilation and she opted for placement of SPC under cystoscopic guidance in February 2010. The patient had managed her SPC well and had no documented or selfreported problems with SPC changes.

INVESTIGATIONS

The patient's white cell count was 13.1×10^9 cells/L, renal function was normal. Urinalysis by dipstix showed ++ leucocytes, no nitrites and +++ blood. Per-urethral urine culture grew *Klebsiella pneumoniae* >100 000 organisms/mL. This organism had also grown from a catheter urine culture 1 year previously. A plain X-ray of kidneys, ureter and bladder was undertaken which did not identify bladder calculi and showed no evidence of bowel obstruction.

DIFFERENTIAL DIAGNOSIS

Causes of recurrent SPC blockage include bladder infection, bladder stones and bladder mucosal overgrowth around the catheter tip.[1] The combination of catheter blockage and cloudy 'pungent' urine

could be explained by purulent bladder infection. However, there was suspicion that the green fluid draining from the catheter was bile. Given this patient's history of rectal cancer treated with anterior resection and radiotherapy, enterovesical fistula due to cancer recurrence or radiation injury was considered in the differential.

TREATMENT

The patient was started empirically on oral coamoxiclav on admission for presumed urinary tract infection and admitted. On the evening of admission urine continued to drain urethrally although the SPC was draining good volumes of what was described by nurses as 'smelly green urine'. The patient now reported of having no appetite and had vomited twice. The patient was tachycardic (110 bpm) but other vital signs were normal.

Thirty-six hours after admission, green fluid continued to drain into the bag and continued to cause recurrent catheter blockages. It was therefore decided to perform a rigid cystoscopy and bladder washout under a general anaesthetic. The urethra was dilated. Bilious debris was identified in the bladder and an opening was seen in the left dome of the bladder. There were no other openings into the bladder and the SPC tip was not seen. The bladder was washed out with 1 L of saline. A urethral catheter was placed, SPC removed, a stoma bag placed on the SPC site, and the patient was started on intravenous antibiotics. This plan was discussed with the colorectal team who agreed.

An urgent CT with oral and intravenous contrast was undertaken (figure 1). A fistulous tract was identified that passed from the skin 4 cm above the pubic symphysis, into a loop of pelvic small bowel 2 cm deep to the skin and from there into the anterior wall of the bladder. The bowel wall and the anterior bladder wall were thickened with chronic appearances. Oral contrast had reached the large bowel. There was no intra-abdominal contrast leakage or collection. There was no evidence of rectal cancer recurrence. There was no evidence of other fistulous tract or radiation injury in the pelvis.

OUTCOME AND FOLLOW-UP

The patient was reviewed at the urology ward by the colorectal team following CT scanning. The patient still did not report of any abdominal pain and her abdomen was soft and non-tender. The vescicoenterocutaneous fistula had discharged 30 mL of bilious fluid since SPC removal. The following day the patient was allowed a normal diet. Over the next 24 h the fistula did not discharge any material. The patient was discharged 4 days after her bladder washout with urethral catheter in place. Eight weeks later the patient returned to the nurse at the urology clinic. The patient remained well, reported no discharge from the fistula, had no visible cutaneous fistula opening and had a successful change of her urethral catheter. The patient was happy to have a long-term urethral catheter.

DISCUSSION

SPC insertion is often considered as a simple procedure. However, it carries a mortality rate of 1.8%[2] and even in cystoscopic-guided insertion, the rate of bowel injury is between 2% and 3%.[2 3] The presence of a lower abdominal scar from previous lower abdominal surgery contraindicates blind percutaneous insertion of SPC due to the high risk of bowel injury. Along with the literature, the case presented here emphasises that cystoscopic guidance does not 100% ameliorate the risk of bowel injury. The British Association of Urological Surgeons (BAUS) recognised this in their guidance on SPCs published in 2011[1] (after this patient had her SPC inserted). BAUS recommend that in the presence of a lower abdominal scar, SPC should be inserted either under ultrasound image guidance or by open dissection. The National Patient Safety Agency (NSPA) goes one step further and recommends that *all* SPCs be inserted under ultrasound guidance.[4] Recent publication has emphasised that the use of ultrasound guided SPC insertion is critically dependent on operator training and experience.[5] This poses major issues for training, equipment availability and transfer of patients to centres with the facilities and expertise available. There is no published evidence that ultrasound-guided SPC insertion reduces the incidence of bowel injury.

There are three cases of delayed presentation of bowel perforation secondary to SPC insertion in the literature. Two patients presented after the first catheter change at around 3 months[6 7] after SPC insertion, one patient presented 8 months after SPC insertion.[8] All three patients presented with abdominal pain and peritonism and required laparotomy to repair the bowel injury. There is one case of small bowel mesentery perforation by SPC that eventually resulted in an ischaemic stricture presenting as small bowel obstruction 4 years after insertion.[9]

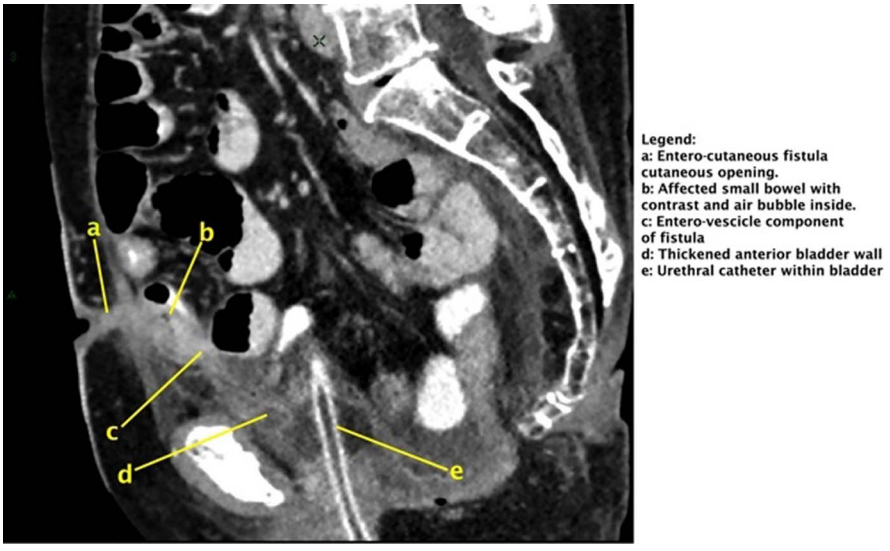

Figure 1 Intravenous and oral contrast-enhanced saggital CT abdomen and pelvis. Cystoenterocutaneous fistula showing.

We believe that the evidence presented in this case suggests that small bowel transfixation occurred at the time of SPC insertion. There was no clinical evidence of bowel perforation at the time, the in-situ catheter may have held the hole sealed and this has previously been reported in two case reports.[3 4] Our patient underwent successful first catheter change in hospital 10 weeks after the cystoscopic insertion. We assume that a sufficiently mature vescicoenterocutaneous fistula had already formed after 10 weeks that allowed the replacement catheter to be placed through the skin, through the small bowel and into the bladder where the balloon was inflated allowing normal urine drainage. For the next 3 years replacement catheters followed the same tract through the bowel, and the bowel functioned normally with liquid small bowel contents flowing past the transluminal silicone catheter. We suggest that over time, the inflammation in the bowel and bladder wall had eventually resulted in stenosis of the vescicoenteral communication. On attempted catheter replacement, the catheter was diverted to the small bowel and the balloon was inflated. The stenosis must have been such that the catheter could no longer pass, however, urine and bowel contents could still communicate freely between the bowel and bladder.

The possibility that a de novo fistula occurred some time after SPC insertion was considered given the history of pelvic irradiation. However, there was no evidence of radiation injury or fistulation in the pelvis on MRI performed 4 years after radiation therapy. Furthermore the nature of the vescicoenterocutaneous fistula was such that it aligned straight from the skin at the point of SPC insertion, through adjacent points on opposite walls of the small bowel and into the bladder. The discrete nature of the tract was felt highly unlikely to represent a radiation-induced fistula by a specialist uro-radiologist.

Urethral catheter placement was made possible on removal of SPC by urethral dilation that was not undertaken when the patient first presented with urethral stenosis because she preferred to have SPC inserted. Since the patient has now had no problems with her long-term urethral catheter and enjoys a good quality of life using it, it has not been removed but further urethral dilation with or without trial without catheter would be an option in the future should problems such as difficulty with catheter changes arise.

In conclusion, although the risk of bowel injury is present in all SPC insertions it is greater in patients with previous lower abdominal surgery. Even radiologically guided insertion cannot prevent bowel injuries, as bowel loops may be compressed or empty at the time of scanning and SPC insertion. The safest method of insertion is an open cystotomy where the presence of bowel loops can be directly visualised during careful dissection. This case report emphasises that bowel injury is a complication of SPC insertion that must be considered at any time after initial insertion.

Learning points

- For all specialties including urology—a high level of suspicion of bowel injury should be maintained in anyone with a suprapubic catheter (SPC) which may present even years later.
- Cystoscopic SPC insertion does not ameliorate completely the risk of bowel injury, open insertion should be considered for patients with previous lower abdominal surgery.
- Abdominal signs and symptoms may not be present in cases of bowel injury secondary to SPC insertion, especially in late presentations.
- Presenting features may include recurrent catheter blockage, difficult catheter changes or feculent/bilious fluid in the catheter and should prompt early referral to urological services.
- Clinical and CT evidence of free intraperitoneal leakage must be sought for before embarking on laparotomy since in this late presentation the patient was well, had a mature fistulous tract and was successfully managed without laparotomy.

Contributors All the authors contributed to the conception and design. KMG reviewed the case notes and produced the first and subsequent drafts after editing by the other authors. All the authors approved the final published version.

Competing interests None.

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Unexpected outcome (positive or negative) including adverse drug reactions